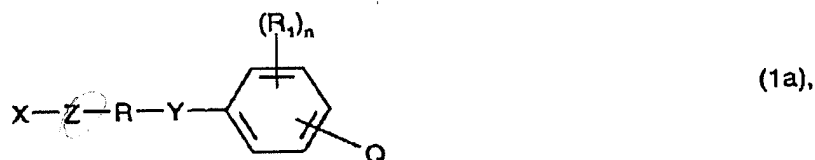


09/606,040

# Claims

1. A process for the preparation of a carbohydrate structure on a material surface comprising the steps of:

(a<sub>1</sub>) photochemically fixing one or more different compounds of formula



onto the material surface,

wherein X is the radical of a mono- or oligosaccharide,

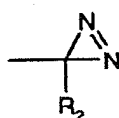
R is a divalent organic radical having from 2 to 30 C-atoms which may be further substituted,

Z is -O-, -S- or a direct bond,

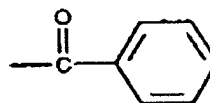
Y is a functional group linking R to the aromatic ring,

R<sub>1</sub> is an electron-withdrawing substituent and n is an integer from 0 to 4,

Q is a radical of formula



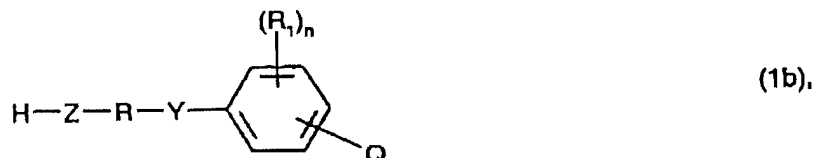
(2a) or



(2b)

and R<sub>2</sub> is an electron-withdrawing substituent; or

(a<sub>2</sub>) photochemically fixing a compound of formula



wherein R, R<sub>1</sub>, n, Y, Z and Q are as defined above, onto the material surface and subsequently converting the -ZH groups to -Z-X moieties, wherein X has the above meaning; and

(b) enzymatically attaching one or more further carbohydrates to the X radicals of the modified surface obtained according to step (a<sub>1</sub>) or (a<sub>2</sub>).

2. A process according to claim 1, comprising steps (a<sub>1</sub>) and (b).

3. A process according to claim 1 or 2, wherein X is the radical of a mono- di-, tri- or tetrasaccharide, preferably the radical of a mono- or disaccharide, and most preferably the radical of a disaccharide.

4. A process according to claim 3, wherein X is the radical of a galactose, lactose mannose, N-acetyl glucosamine, N-acetyl galactosamine or N-acetyl lactosamine.

5. A process according to any one of claims 1 to 4, wherein R is linear or branched C<sub>2</sub>-C<sub>24</sub>-alkylene, preferably linear C<sub>4</sub>-C<sub>18</sub>-alkylene and most preferably C<sub>6</sub>-C<sub>10</sub>-alkylene, which in each case may be interrupted by -O- or -NR<sub>3</sub><sup>+</sup>, and R<sub>3</sub> is hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl.

6. A process according to any one of claims 1 to 5, wherein Y is a group -C(O)O-, -OC(O)-, -C(O)NR<sub>4</sub>-, -NR<sub>4</sub>C(O)-, -OC(O)-NH-, -NHC(S)NH- or -NHC(O)NH-, and R<sub>4</sub> is hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl.

7. A process according to any one of claims 1 to 6, wherein R<sub>1</sub> is fluorine and n is an integer from 0 to 4, preferably 0.

8. A process according to any one of claims 1 to 7, wherein Q is a radical of formula (2a), and R<sub>2</sub> is trifluoromethyl.

9. A process according to any one of claims 1 to 8, wherein in step (b) the carbohydrate(s) are attached to the radicals X by means of a glycosyl transferase or a mixture of different glycosyl transferases.

10. A process according to any one of claims 1 to 9, wherein a monosaccharide or a mixture of different monosaccharides or a derivative thereof is attached to the X radicals in step (b).

11. A process according to any one of claims 1 to 10, wherein sialic acid is attached to the X radicals by means of a sialyl transferase in step (b).

12. A material comprising a carbohydrate structure on its surface obtainable by the process according to any one of claims 1 to 11.
13. A biomedical device comprising a material according to claim 12.
14. Use of a material according to claim 12 for the manufacture of a biomedical device.
15. A biosensor for the detection of carbohydrate related interactions comprising a carbohydrate structure on its surface obtainable by the process according to any one of claims 1 to 11.

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